

(51) Int.Cl. <sup>6</sup>	識別記号	片内整理番号	F I
G 0 6 F 3/03	3 8 0	9174-5E	G 0 6 F 3/03 3 8 0 G
	3 1 0	9376-5E	3/02 3 1 0 K
	3 6 0	4230-5E	3/033 3 6 0 C
	3 4 0	9174-5E	3/14 3 4 0 A
G 0 9 F 9/00	3 6 6	7733-5H	G 0 9 F 9/00 3 6 6 E
審査請求 未請求 予備審査請求 有 (全 88 頁) 最終頁に続く			

(21) 出願番号 特願平7-513322  
 (86) (22) 出願日 平成6年(1994)10月28日  
 (85) 翻訳文提出日 平成8年(1996)5月7日  
 (86) 国際出願番号 PCT/US94/12451  
 (87) 国際公開番号 WO95/12877  
 (87) 国際公開日 平成7年(1995)5月11日  
 (31) 優先権主張番号 08/147, 545  
 (32) 優先日 1993年11月5日  
 (33) 優先権主張国 米国 (US)  
 (31) 優先権主張番号 08/225, 782  
 (32) 優先日 1994年4月11日  
 (33) 優先権主張国 米国 (US)

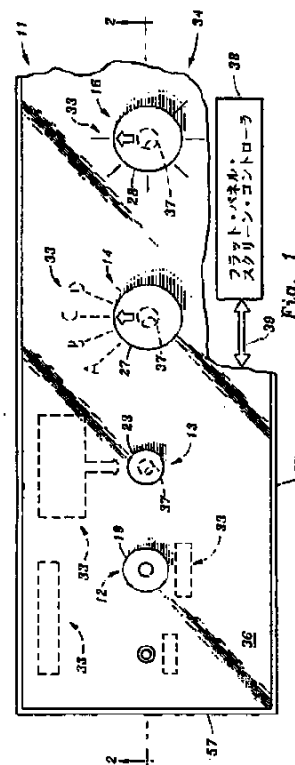
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 6120  
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(54) 【発明の名称】 ディスプレイ・スクリーンと一体化されたオペレータ/回路インターフェース装置

## (57) 【要約】

スイッチ・ボタン (12、13) や回転つまみ (14) 等のエレクトロメカニクス用の制御デバイス (12、13、14、16) を備えると共に、それら制御デバイスに関する情報を伝達するためのフラット・パネル・ディスプレイを備え、このフラット・パネル・ディスプレイに表示する情報をディスプレイ制御装置によって即座に切り替えられるようにすることによって、オペレータと電氣的システムとの間のインターアクションを容易にしている。そのディスプレイ (33) には、例えば制御デバイスの機能や、制御デバイスの現在設定位置を示したり、校正マークを生成したりすることができ、また更にその他のグラフィックスを表示することもできる。同一の制御デバイスに複数の機能を持たせる場合には、複数の画像が自動的に切り替わるようにしておく。本発明の1つの形態においては、ディスプレイのスクリーンの画像領域に複数の開口を形成し、複数の制御デバイスがそれら開口を介してスクリーンから突出するようにしており、それによって、それら制御デバイスに近接した位置にグラフィックスを表示できるようにしている。別の形





































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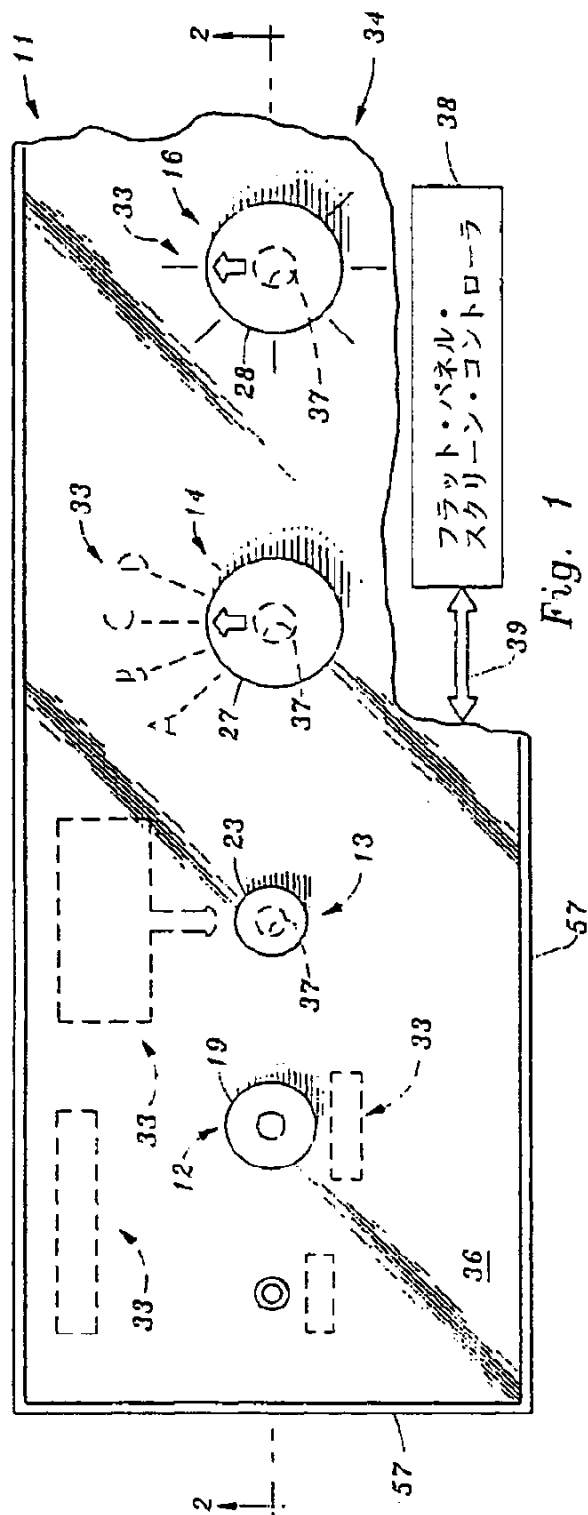












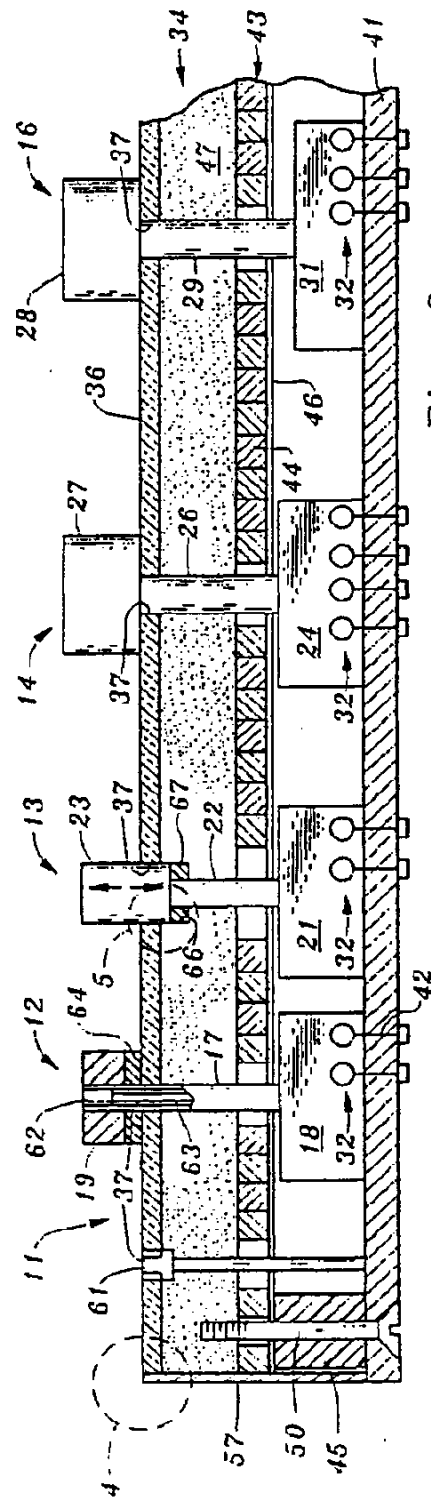
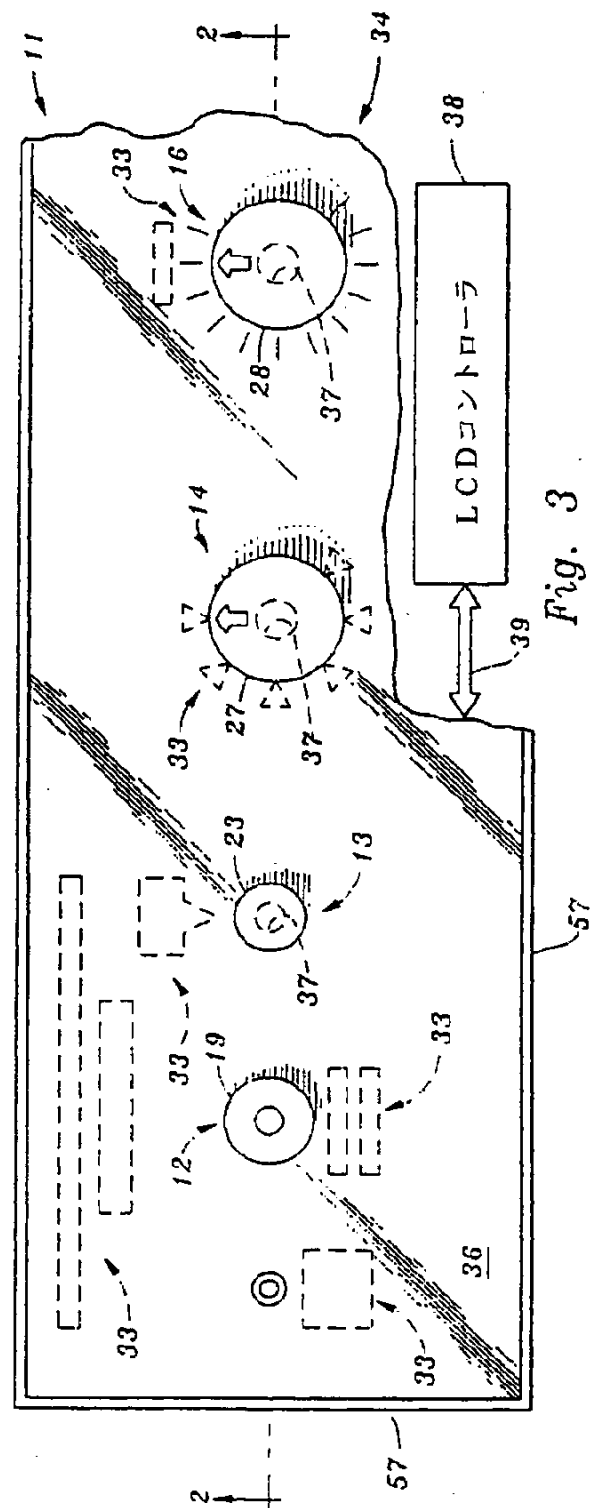


Fig. 2



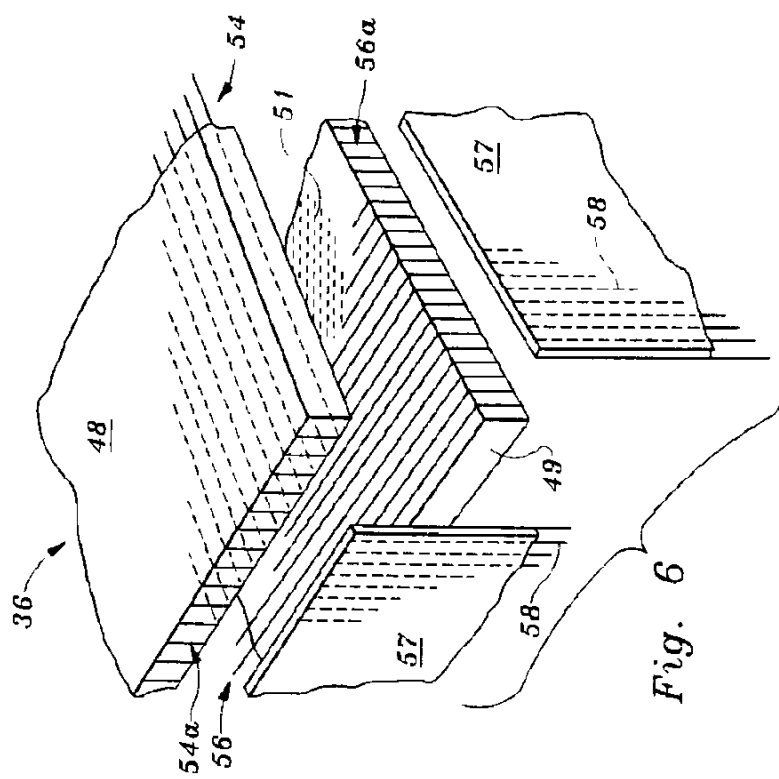


Fig. 6

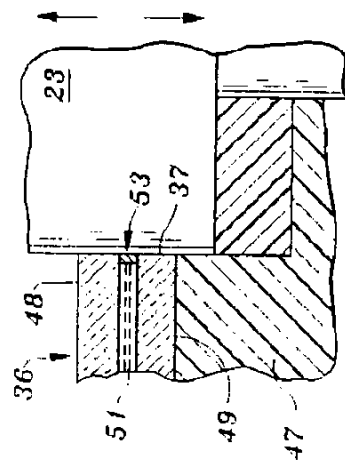


Fig. 5

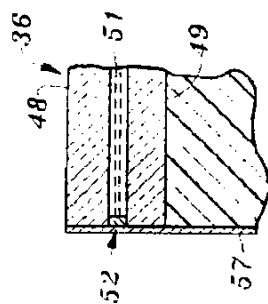


Fig. 4

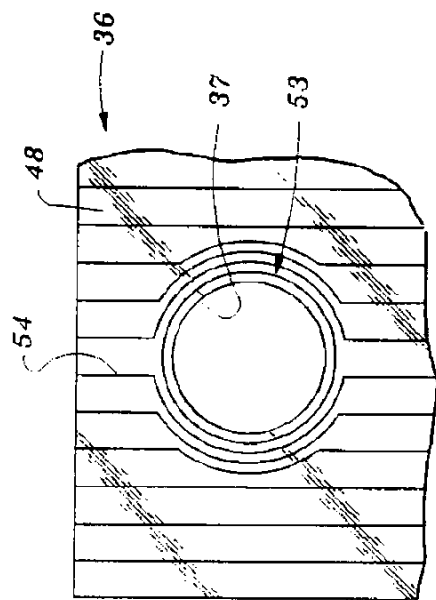
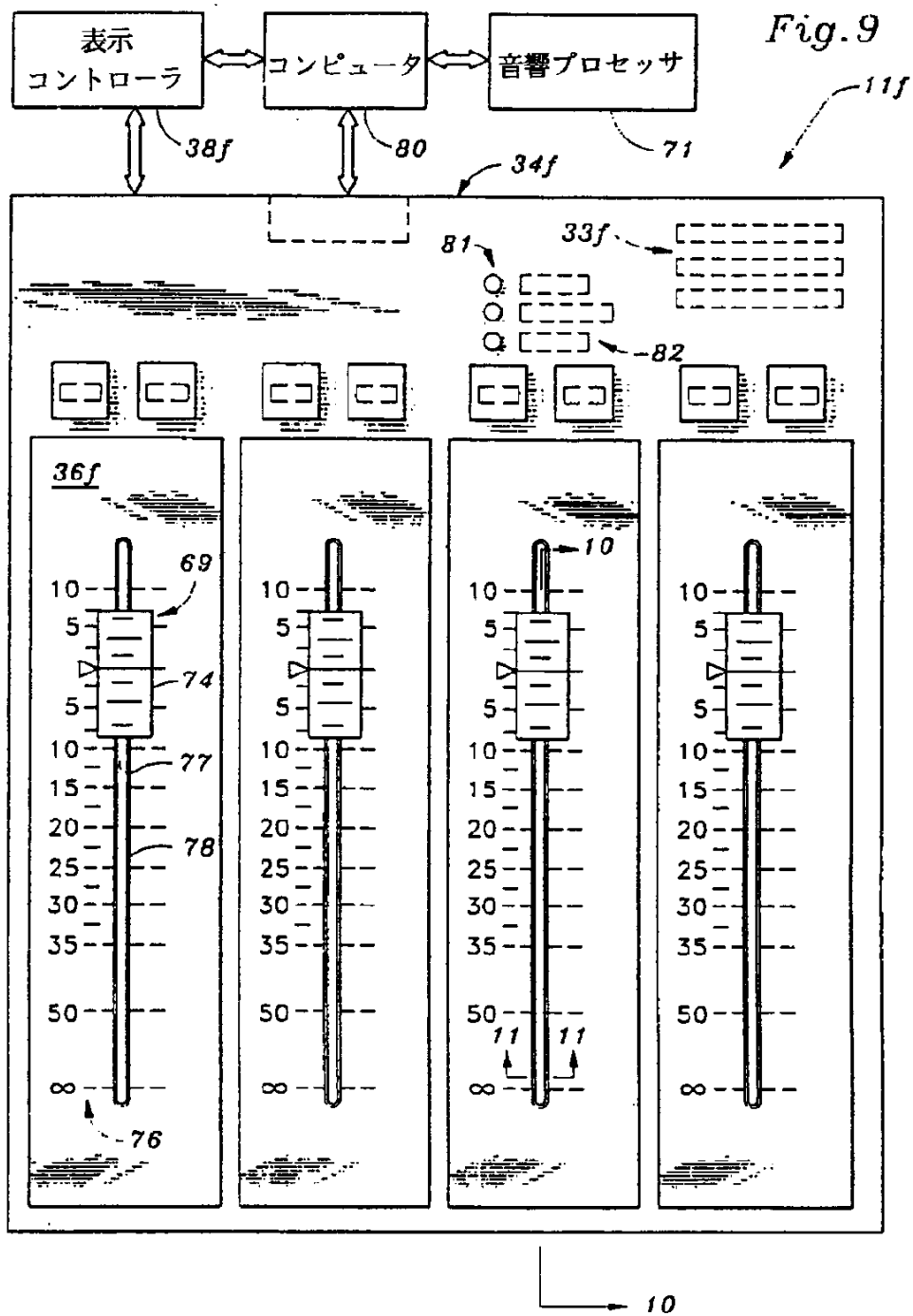
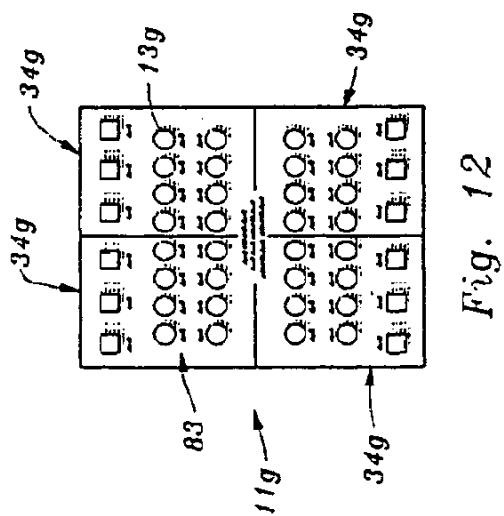
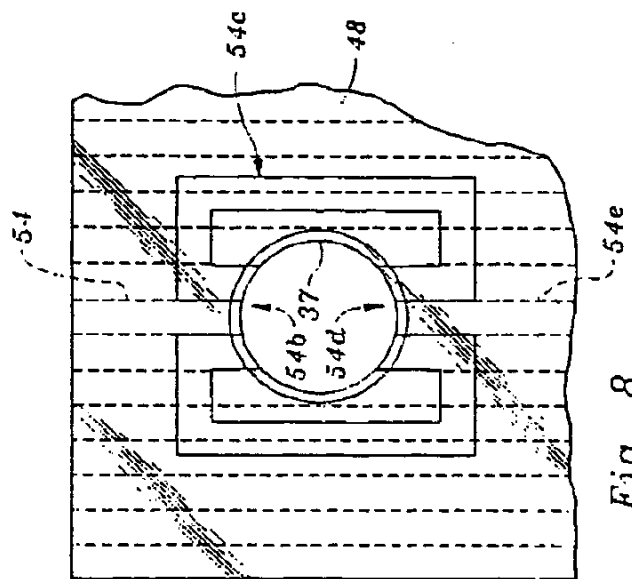


Fig. 7







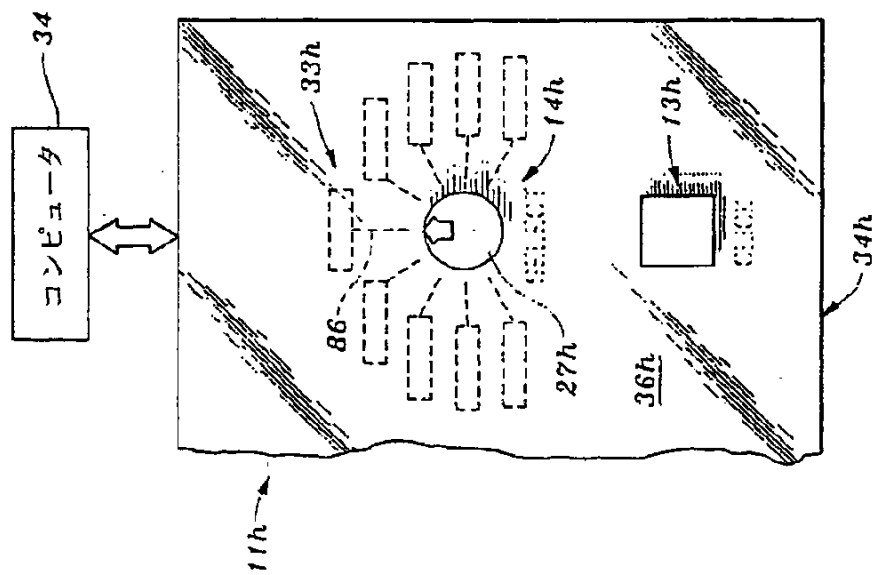


Fig. 16

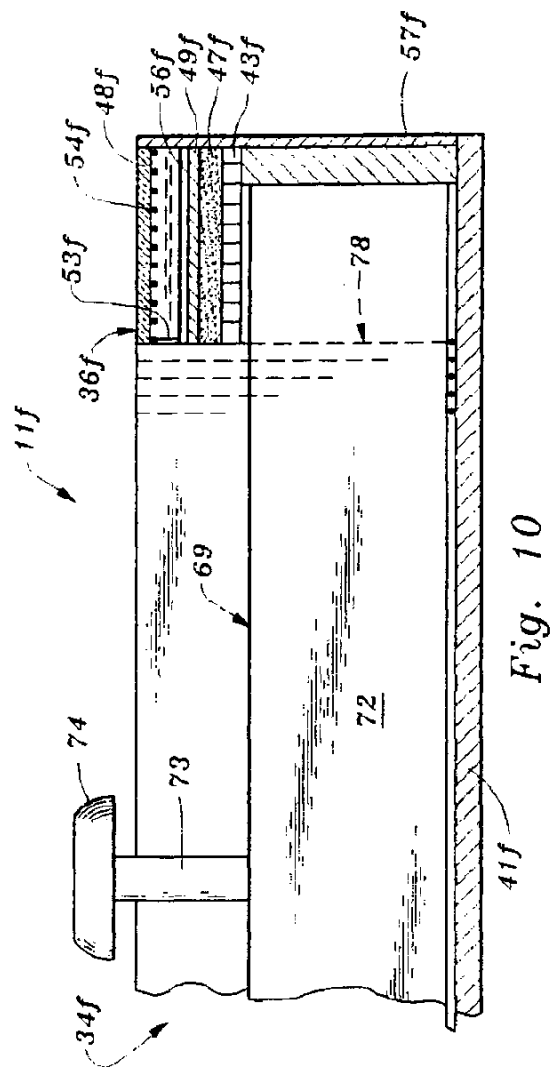


Fig. 10

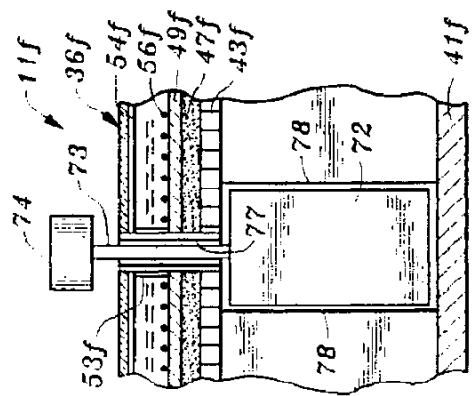


Fig. 11

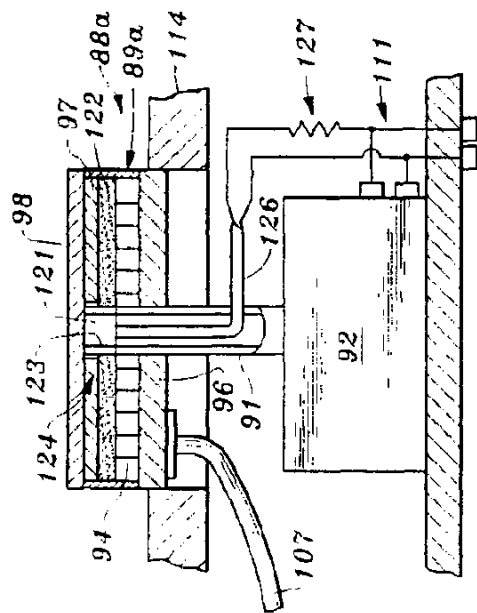


Fig. 15

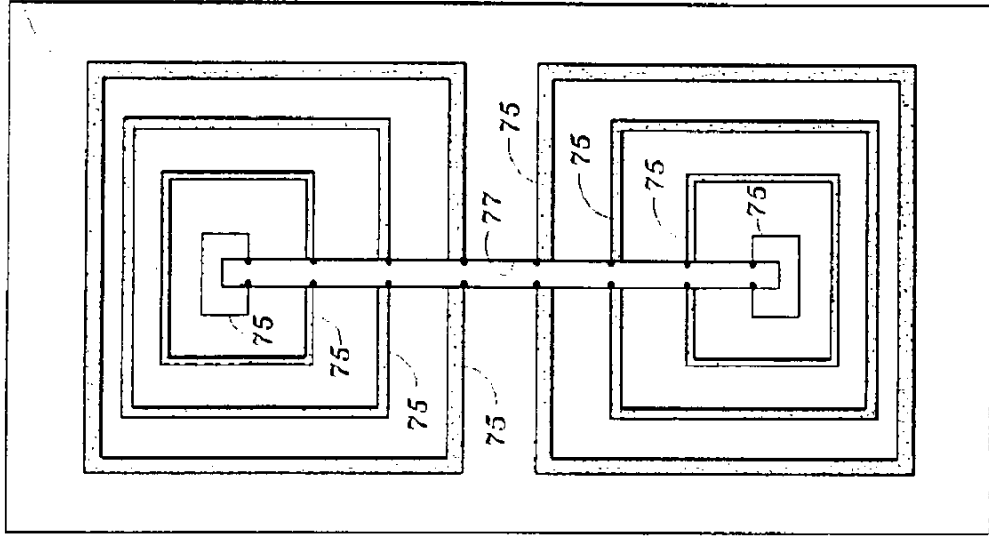


Fig. 11A

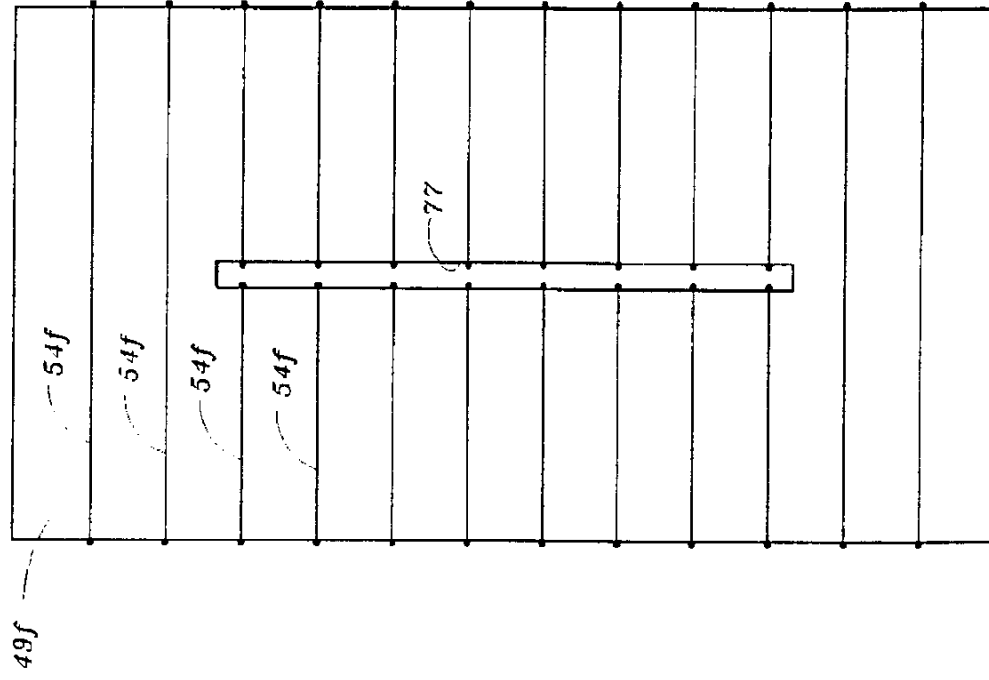


Fig. 11B

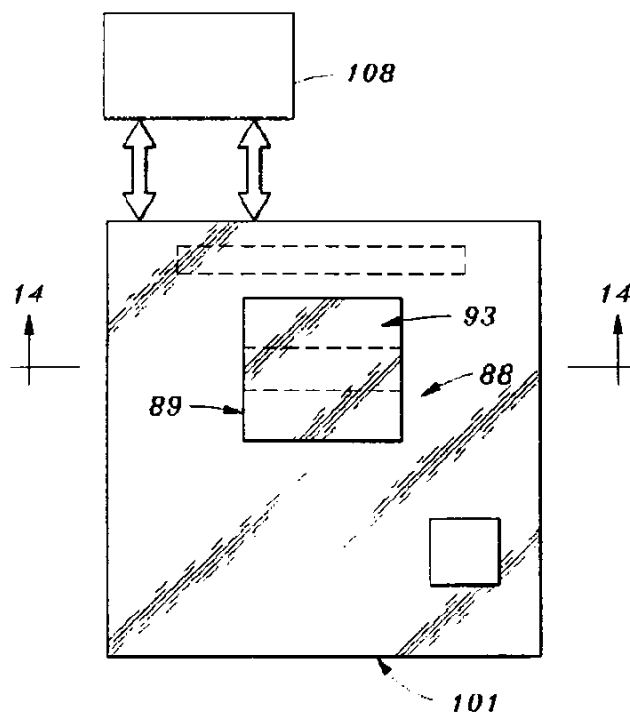


Fig. 13

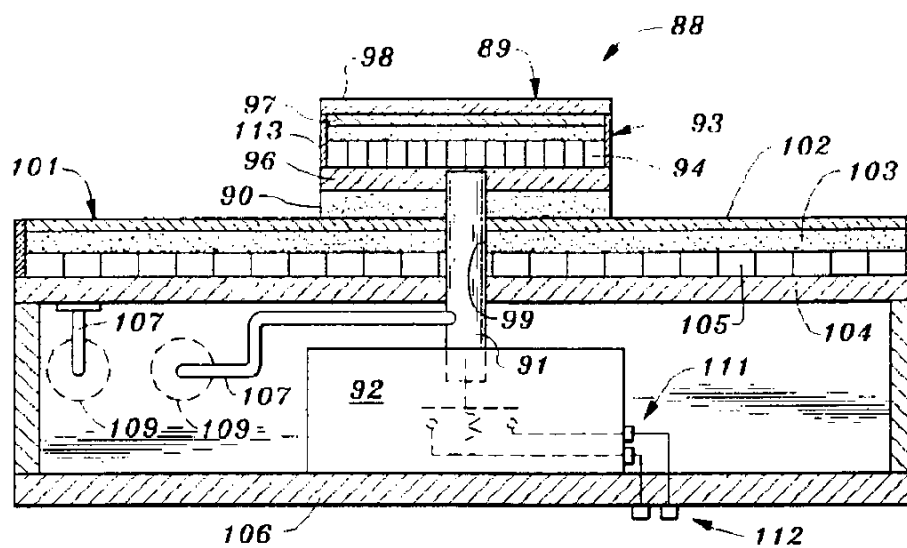


Fig 14

Fig. 17A

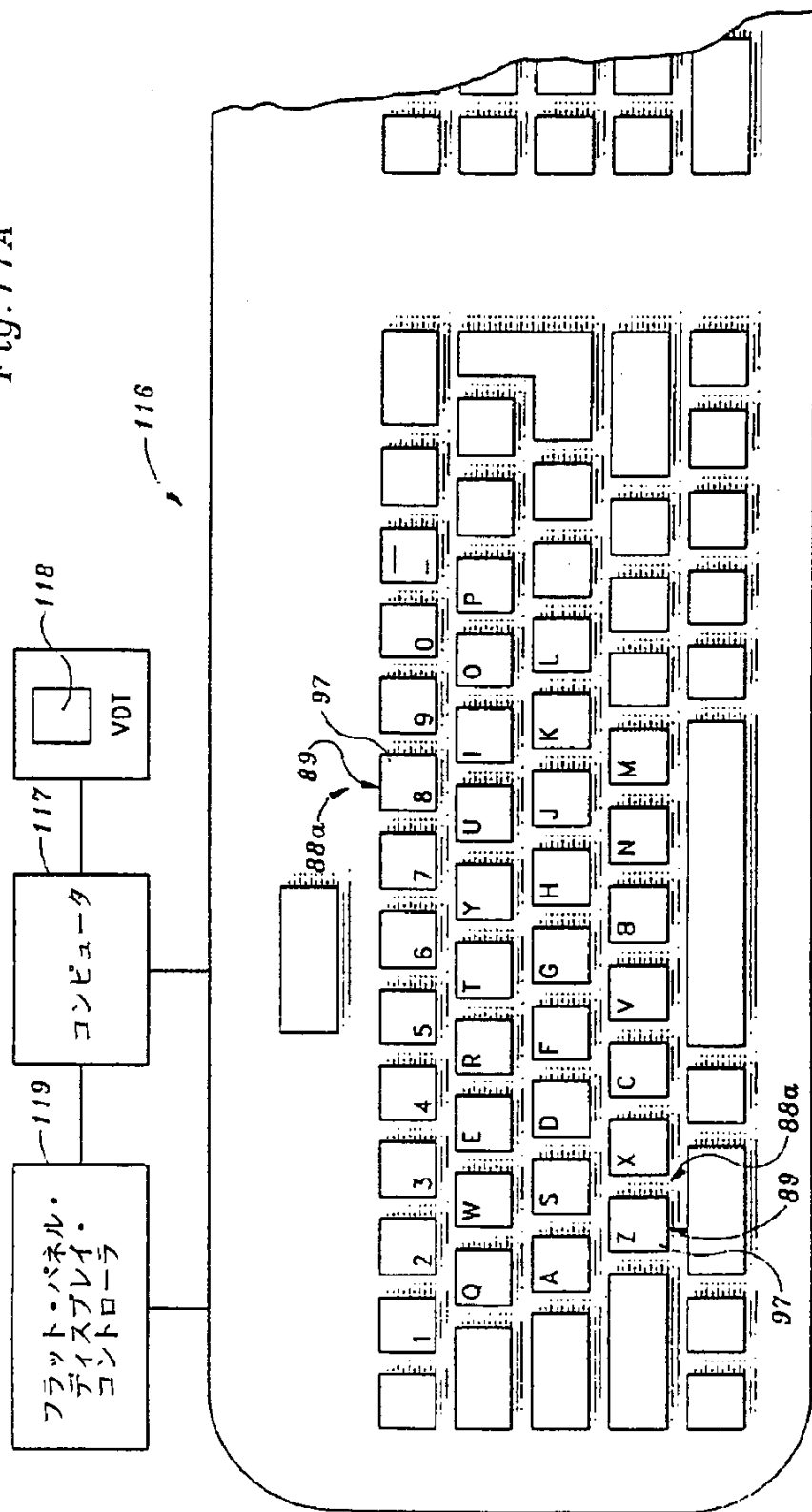
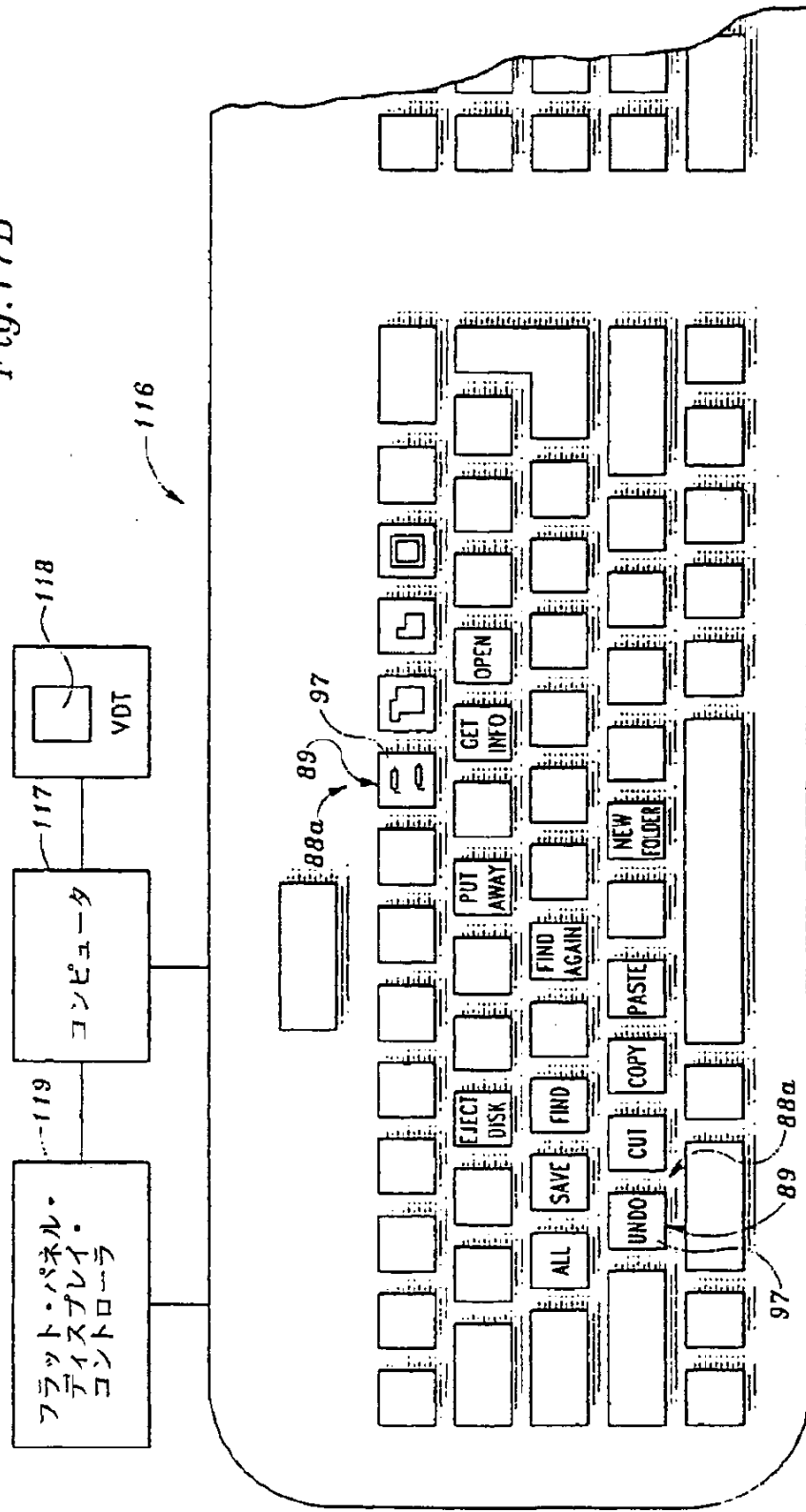
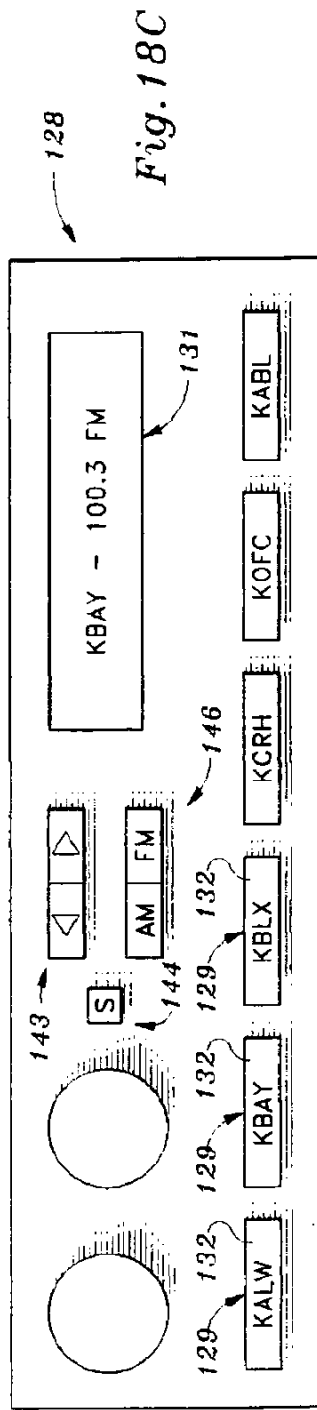
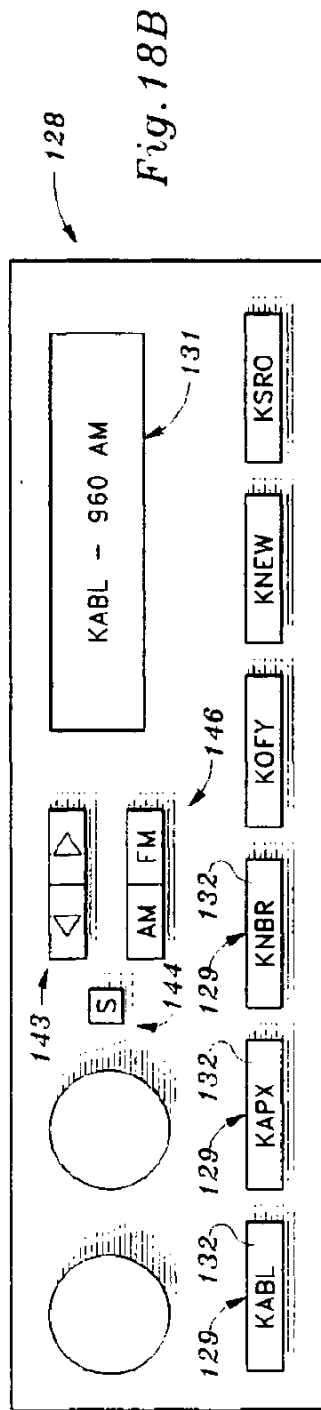
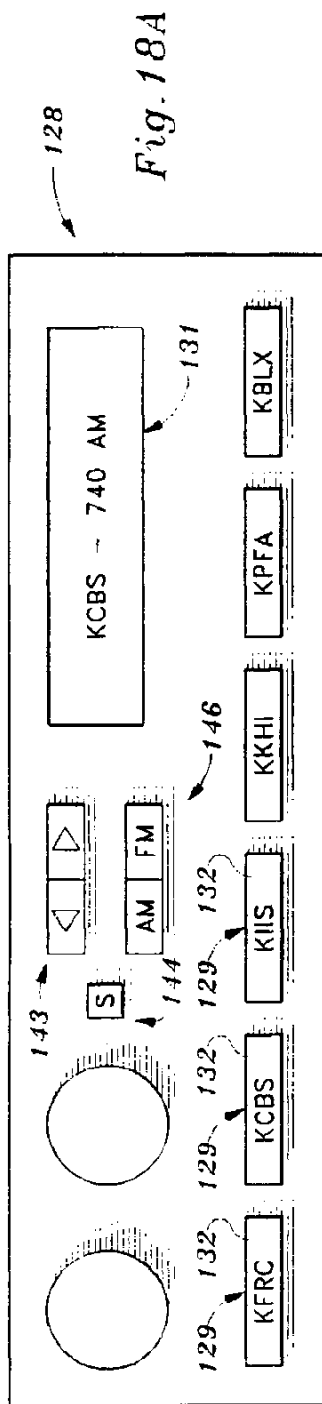


Fig. 17B





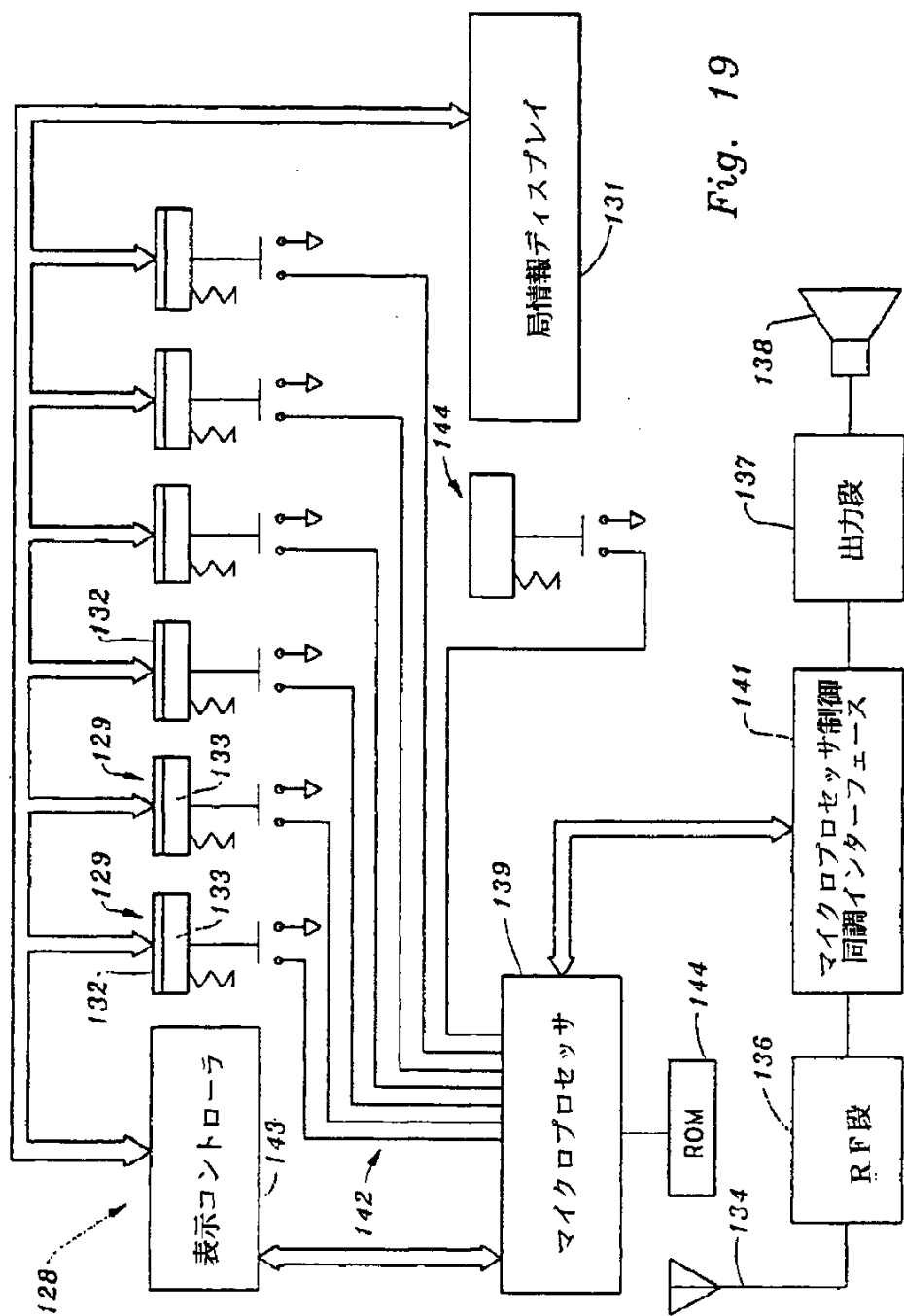


Fig. 19



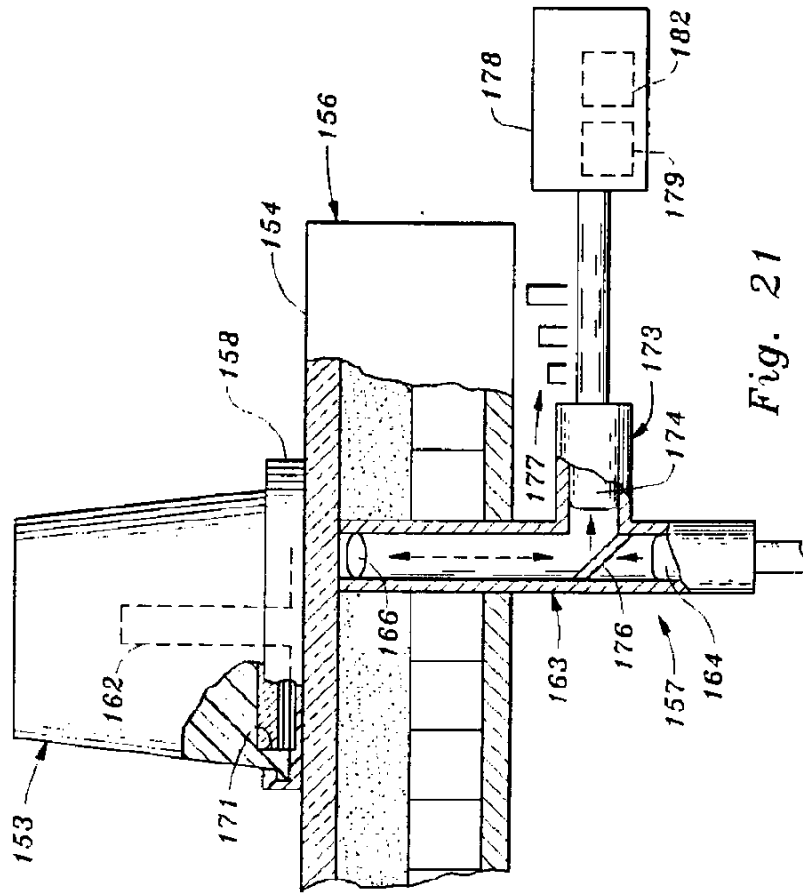


Fig. 21

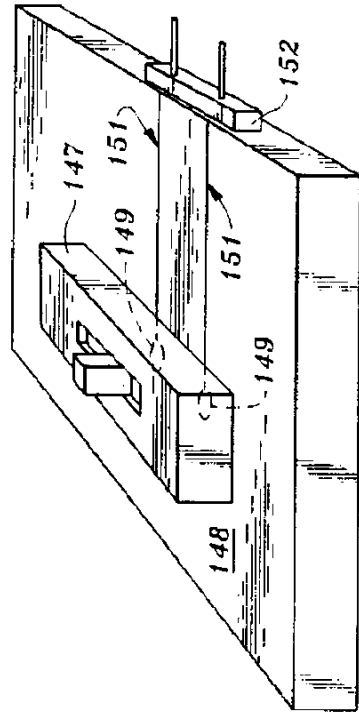
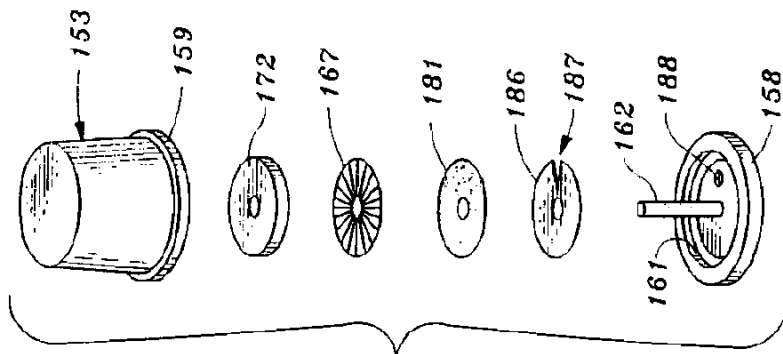
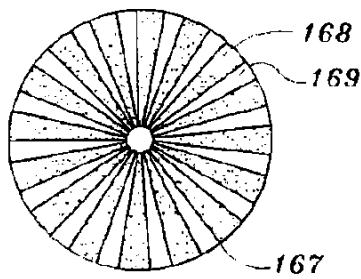


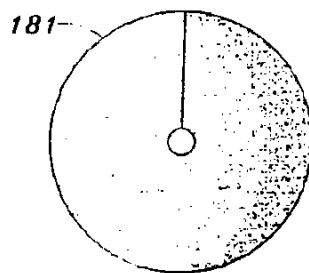
Fig. 20



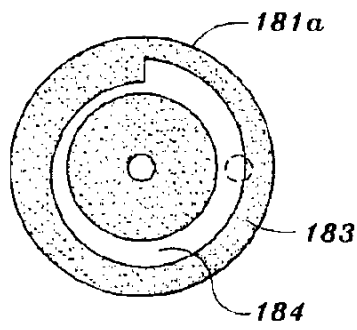
*Fig. 22*



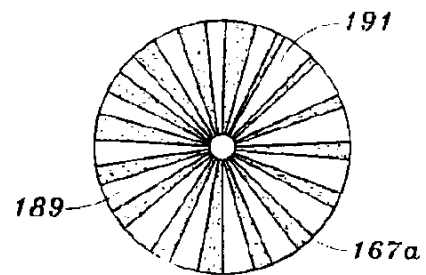
*Fig. 23*



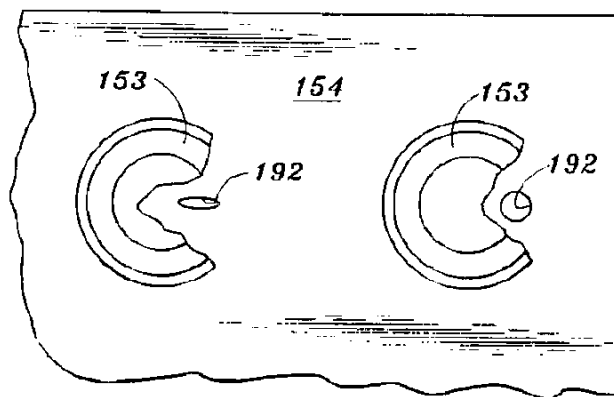
*Fig. 24*



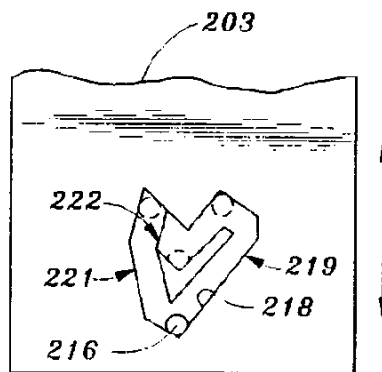
*Fig. 25*



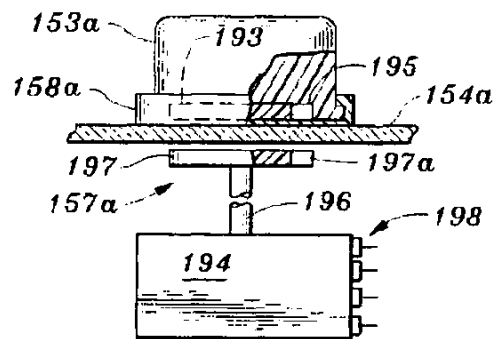
*Fig. 26*



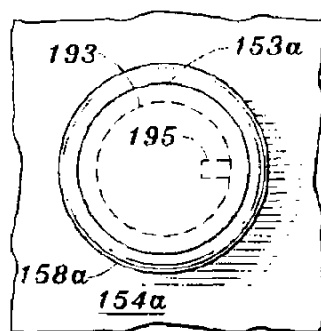
*Fig. 27*



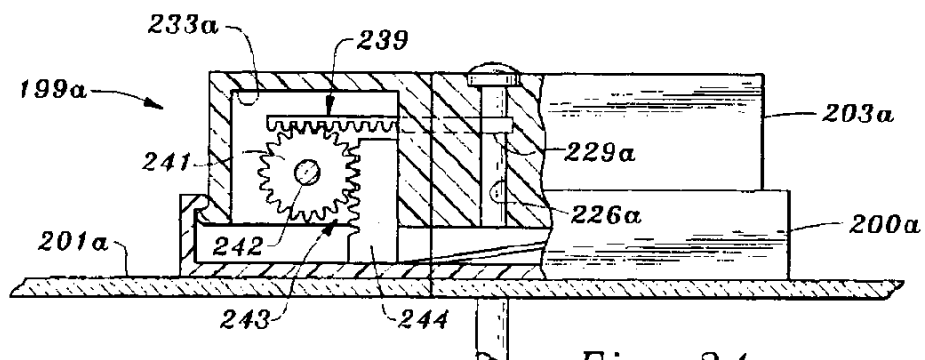
*Fig. 33*



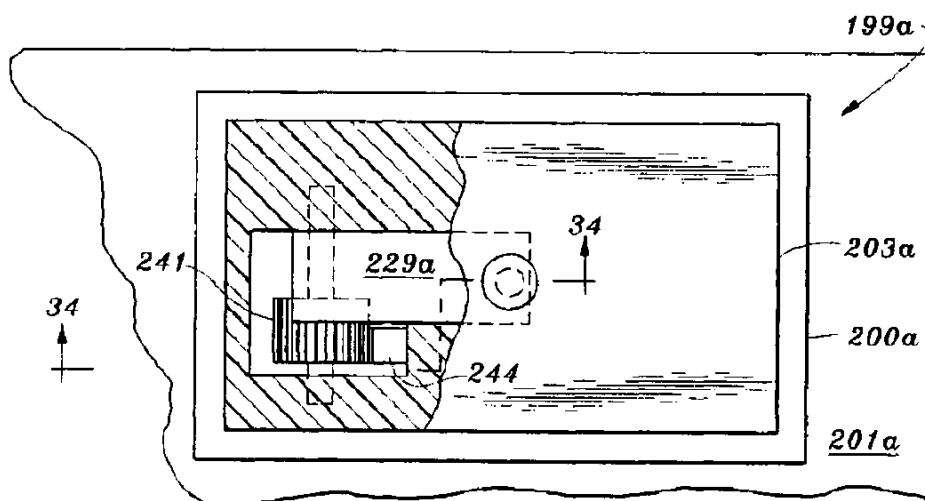
*Fig. 28*



*Fig. 29*



*Fig. 34*



*Fig. 35*

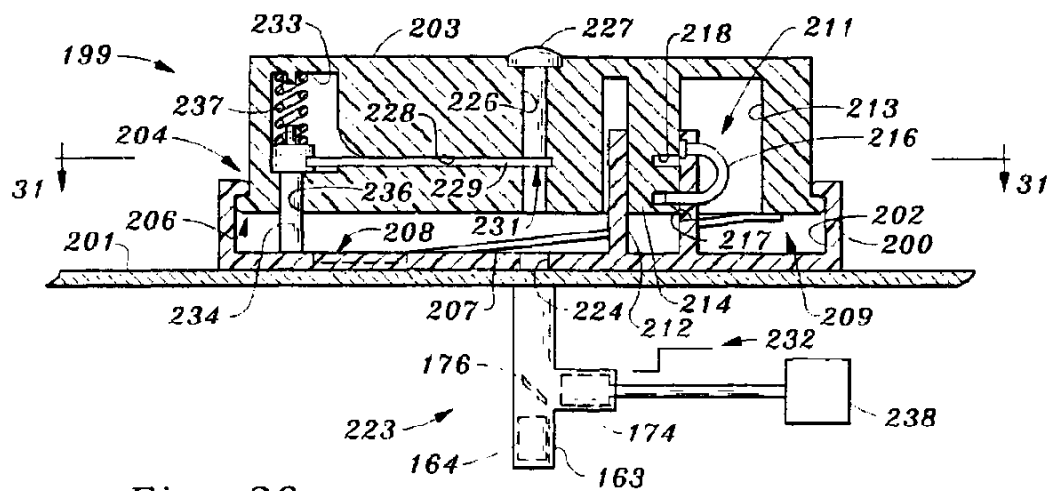


Fig. 30

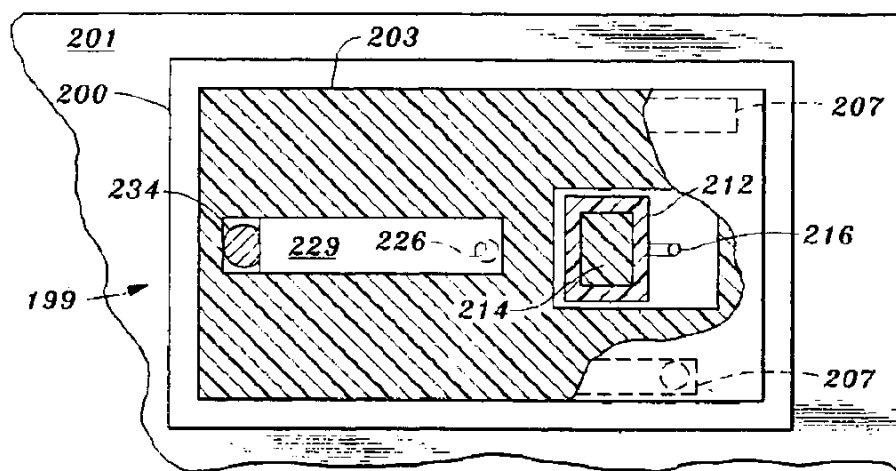
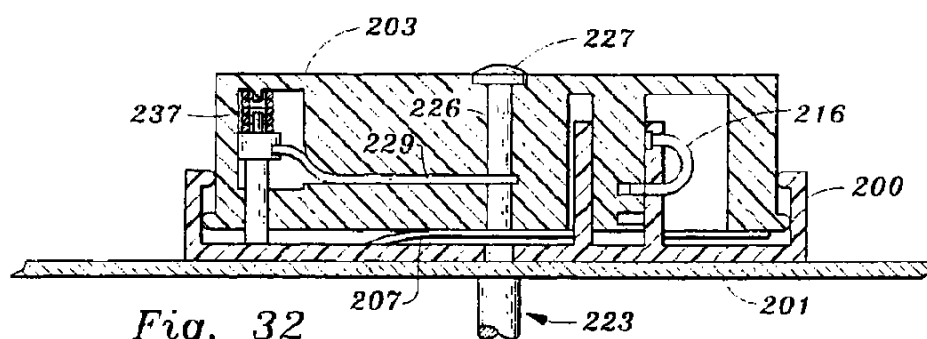
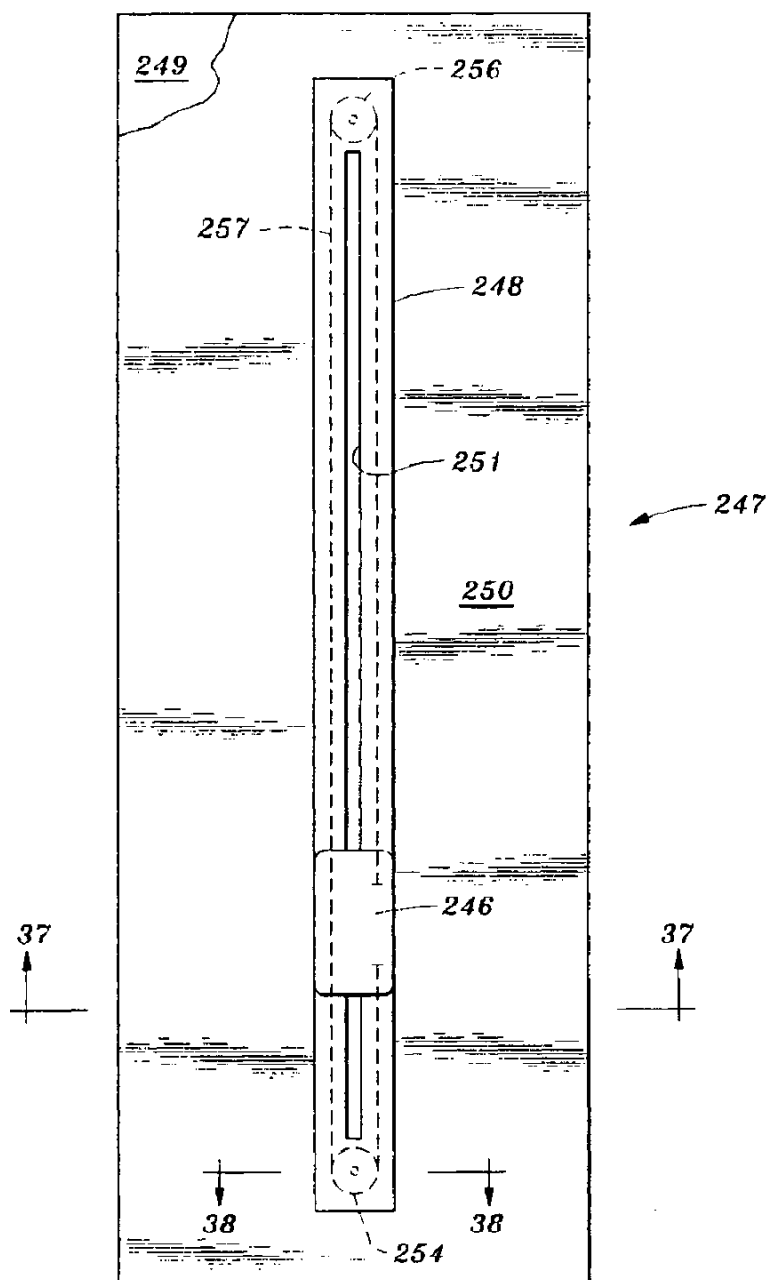
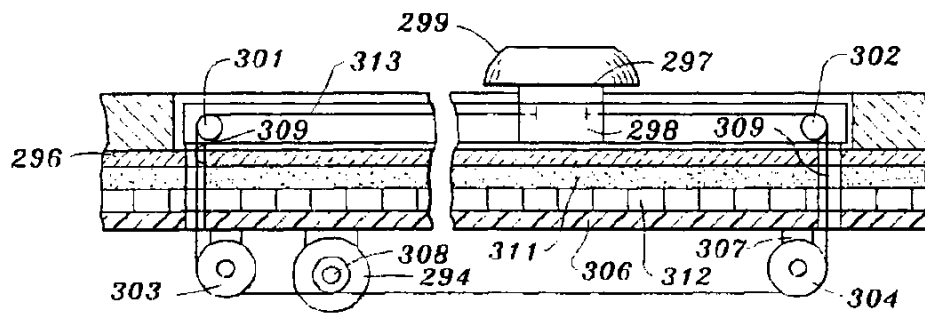
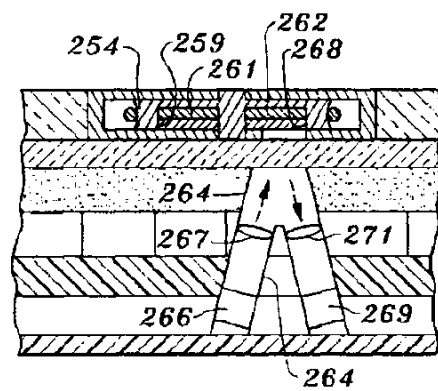
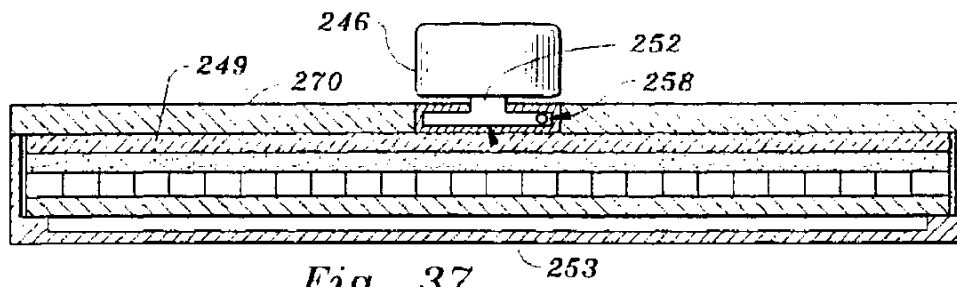


Fig. 31

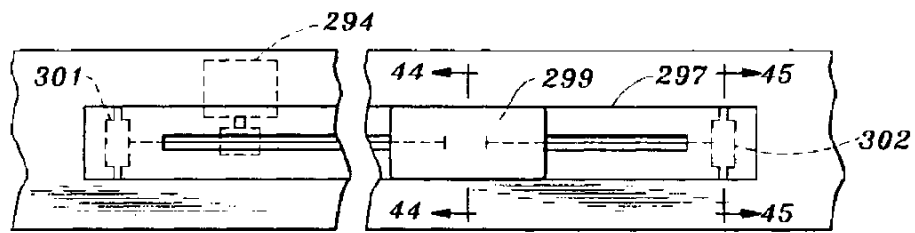




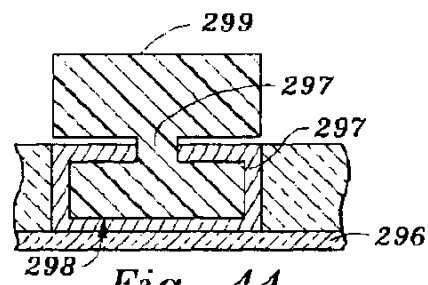
*Fig. 36*



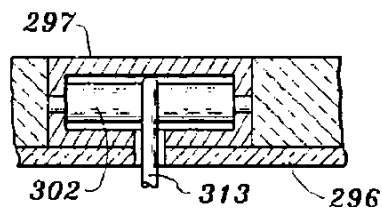




*Fig. 43*



*Fig. 44*



*Fig. 45*

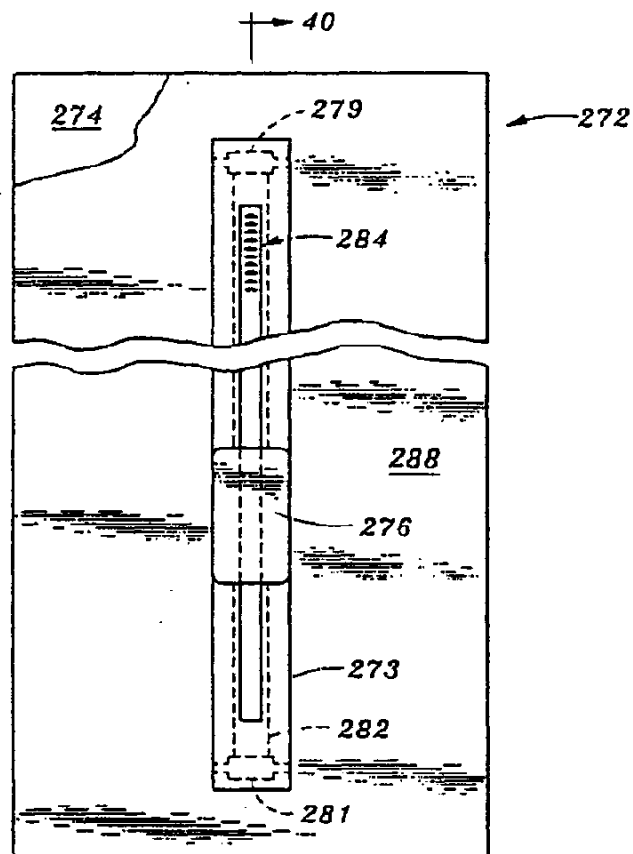


Fig. 39

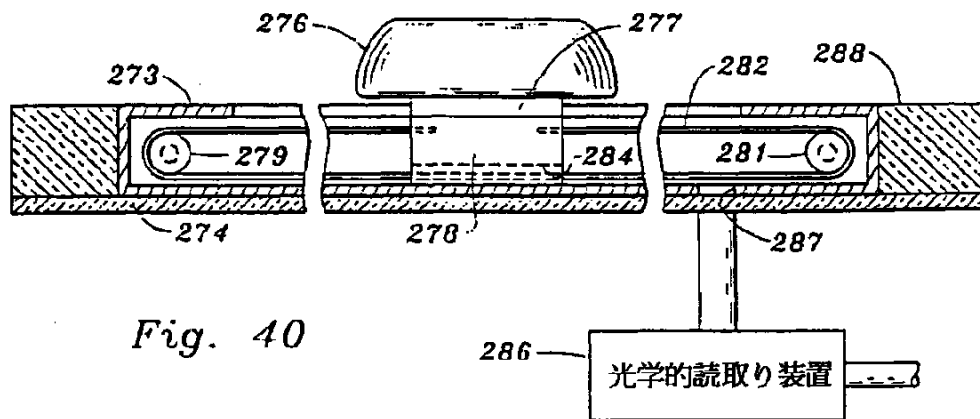
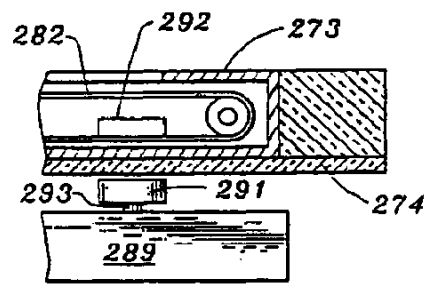


Fig. 40



*Fig. 41*

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US94/12451

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G09G 3/02

US CL : 345/168

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/168-173,184; 341/22,23,28,33,34

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB, A, 2038055 (YOSHIDA) 16 July 1980, see Figs. 1-4,15(b).	1,2
X ----- Y	JP, A, 52-42328 (TADA) 01 April 1977, see abstract.	1-4,15,24, 26, 31-45 ----- 5, 12-14, 16-23, 25, 27-30
Y	US, A, 3,798,611 (GALLANT ET AL) 19 March 1974, see Fig. 1.	5,12-14
Y,P	US, A, 5,266,949 (ROSSI) 30 November 1993, see abstract.	16,20,25
Y	US, A, 5,156,049 (DOUGLAS) 20 October 1992, see col. 8, lines 21-22,36-39.	17,18

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	*T* later documents published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* documents defining the general state of the art which is not considered to be part of particular relevance	*X* documents of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* documents of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* documents which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reasons (as specified)	*Z* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*F* documents published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

22 JANUARY 1995


Date of mailing of the international search report

13.4 MAR 1995

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 Commissioner of Patents and Trademarks  
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 Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

  
 REGINA LIANG

Telephone No. (703) 305-4700

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US94/12451

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,551,717 (DREHER) 05 November 1985, see abstract, Fig. 1	21-23
Y	US, A, 5,191,320 (MACKAY) 02 March 1993, see abstract, Fig. 1.	19,30,55

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US94/12451

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
1-45,55

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US94/12451

### BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

- I. Claims 1-45, 55, drawn to circuit component and display screen, classified in Class 345, subclass 156.
- II. Claims 46 and 47, drawn to control panel with a flat panel display, classified in Class 345, subclass 104.
- III. Claims 48-54, drawn to a structure of the switch cap, classified in Class 341, subclass 23.
- IV. Claims 56 and 57, drawn to selector switches in a radio, classified in Class 340, subclass 407.2.
- V. Claims 58 and 59, drawn to a keyboard with a multiple function key, classified in Class 345, subclass 172.
- VI. Claims 60-63, drawn to mechanical elements of a switch cap, classified in Class 341, subclass 31.

2. The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Inventions I and II-VI are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination, and (2) that the subcombination has other combinations. In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require a control panel with (II) a flat panel display, (III) a switch cap with an embedded display, (IV) a radio with plural station selector switches and plural flat panel displays, (V) a keyboard with a flat panel display embedded in a multiple function key, and (VI) a switch cap having a resilient element and returning means. The subcombinations have corresponding features such as in selector switches in a radio and keyboard with an integral display, etc.

